

VERMONT AGENCY OF NATURAL RESOURCES  
Department of Environmental Conservation  
Air Quality & Climate Division

**TECHNICAL SUPPORT DOCUMENT**

**FOR**

**TITLE V**

**PERMIT TO CONSTRUCT AND OPERATE**

**#AOP-19-010**

**DEC PIN# # EJ96-0028**

May 13, 2022

**WestRock Converting  
Sheldon Springs, VT**

**Owner/Operator:** WestRock Company  
1000 Abernathy Road NE  
Atlanta, GA 30328

**Source:** WestRock Converting LLC  
Paperboard Manufacturing Facility  
369 Mill Street  
Sheldon Springs, VT 05485

Prepared By:  
Steven Snook – Environmental Engineer  
Air Quality & Climate Division

*This Technical Support Document details the Agency of Natural Resources, Department of Environmental Conservation, Air Quality & Climate Division review for the Air Pollution Control Permit to Construct and Operate is intended to provide additional technical information, discussion and clarification in support of the Permit. It is not intended to provide a comprehensive review of the Facility or permit process or duplicate the information contained in the Permit.*

## 1.0 INTRODUCTION

Rock-Tenn Converting Company Inc. (hereinafter "The Permittee," and also referred to herein as "Owner/Operator") owns and operates a paperboard manufacturing facility (also referred to herein as "Facility") on Mill Street in Sheldon Springs, Vermont.

| <b>Table 1-1: Administrative Summary</b>               |   |
|--|---|
| <b>Administrative Item</b>                             | <b>Result or Date</b>                           |
| Date Application Received:                             | 4/29/2019                                       |
| Date Administratively Complete:                        | 5/1/2019  |
| Date & Location Receipt of Application Noticed:        | VTDEC Environmental Notice Bulletin             |
| Date Technically Complete:                             | 5/1/2019  |
| Date Draft Decision:                                   | 3/8/2022  |
| Date & Location Draft Decision/Comment Period Noticed: | 3/8/2022<br>VTDEC Environmental Notice Bulletin |
| Date & Location Public Meeting Noticed:                | None requested                                  |
| Date & Location of Public Meeting:                     | None requested                                  |
| Deadline for Public Comments:                          | 4/7/2022  |
| Date Final Decision:                                   | 5/13/2022                                       |
| Classification of Source Under §5-401:                 | §5-401(6)(a): Fossil fuel burning equipment     |
| Classification of Application:                         | Title V Subject Source                          |
| New Source Review Designation of Source:               | Non-Major Stationary Source                     |
| Facility SIC Code(s) & Description(s):                 | 2631 - Paperboard Mills                         |
| Facility NAICS Code(s) & Description(s):               | 322130 - Paperboard Mills                       |

The allowable emissions for the Facility are summarized below:

| <b>Table 1-2: Estimated Air Contaminant Emissions (tons/year)<sup>1</sup></b> |           |                       |                       |            |                               |                                    |
|---|-----------|-----------------------|-----------------------|------------|-------------------------------|------------------------------------|
| <b>PM / PM<sub>10</sub> / PM<sub>2.5</sub></b>                                | <b>CO</b> | <b>NO<sub>x</sub></b> | <b>SO<sub>2</sub></b> | <b>VOC</b> | <b>Total HAPs<sup>2</sup></b> | <b>CO<sub>2</sub>e<sup>3</sup></b> |
| 16.1 / 11.6 / 7.8   | 71        | <100                  | 162.3                 | <50        | <8/20                         | 100,077                            |

<sup>1</sup> PM/PM<sub>10</sub>/PM<sub>2.5</sub> - particulate matter, particulate matter of 10 micrometers in size or smaller and particulate matter of 2.5 micrometers in size or smaller, respectively (unless otherwise specified, all PM is assumed to be PM<sub>2.5</sub>); SO<sub>2</sub> - sulfur dioxide; NO<sub>x</sub> - oxides of nitrogen measured as NO<sub>2</sub> equivalent; CO - carbon monoxide; VOCs - volatile organic compounds; HAPs - hazardous air pollutants as defined in §112 of the federal Clean Air Act.

<sup>2</sup> CO<sub>2</sub>e 'at the stack'. Based on boilers and ovens operating 8,760 hrs/yr at max load and emergency engines at 100 hrs/yr. See section 3.4 for details. This is not a facility limit.

## 2.0 FACILITY DESCRIPTION AND LOCATION

### 2.1 Facility Locations and Surrounding Area

The Facility is located in the village of Sheldon Springs, Vermont. It is located near the center of Sheldon Springs and is near several residential areas. The Facility is located approximately 150 kilometers from the Great Gulf and Dry River Wilderness areas in New Hampshire as well as 190 kilometers from the Lye Brook Wilderness area in Manchester, Vermont.

### 2.2 Facility Description

The Facility is a "Title V Subject Source" listed under the Standard Industrial Classification ("SIC") Code 2631, paperboard mills. The regulated sources of air contaminant emissions at the Facility are the four boilers, the four coating dryers, an emergency generator, a diesel-powered fire pump, and the process emissions.

| Table 2-1: Equipment Specifications   |   |                               |   |                                    |
|---|---|-------------------------------|---|------------------------------------|
| Equipment/Make/Model  | Capacity/Size                           | Fuel Type                     | Stack Height (feet) <sup>4</sup>        | Date of Manufacture (Installation) |
| Wickes Boiler #1  | 89 MMBtu/hr <sup>1</sup><br>80 MMBtu/hr | Natural Gas<br>No. 6 fuel oil | 193                                     | 1950                               |
| Cleaver-Brooks Boiler #2  | 28.6 MMBtu/hr<br>28.6 MMBtu/hr          | Natural Gas<br>No. 6 fuel oil | 167<br>(100 for<br>FGHRS <sup>2</sup> ) | 2008                               |
| B&W Boiler #3   | 33 MMBtu/hr<br>33 MMBtu/hr              | Natural Gas<br>No. 6 fuel oil |   | 1950                               |
| B&W Boiler #4   | 31 MMBtu/hr<br>31 MMBtu/hr              | Natural Gas<br>No. 6 fuel oil |   | 1950                               |
| Paperboard Coating Line #1  |   |                               |   |                                    |
| Line Drier #1   | 5 MMBtu/hr                              | Natural Gas                   | 40                                      | 1969                               |
| Line Drier #1b  | 2.98 MMBtu/hr                           | Natural Gas                   |   | 2001                               |
| Cylinder Exhaust #1   |   |                               | 29                                      |                                    |
| Paperboard Coating Line #2  |   |                               |   |                                    |
| Line Drier #2   | Steam supplied from Boilers             |                               | 39                                      | 1969                               |
| Line Drier #2b <sup>3</sup>   | 3.264 MMBtu/hr                          | Natural Gas                   |   | 1998                               |
|   | 1.67 MMBtu/hr                           | Natural Gas                   |   | 2001                               |
| Cylinder Exhaust #2   |   |                               | 39                                      |                                    |
| Emergency Diesel Generator<br>(not operational at the time of permit issuance). | 16 MMBtu/hr                             | No. 2 fuel oil                | 32                                      | 1950                               |
| Emergency Detroit Diesel Fire Pump  | 115 HP                                  | No. 2 fuel oil                | 60                                      | 1970                               |

<sup>1</sup> MMBtu/hr - Million British Thermal Units per hour maximum rated heat input.

<sup>2</sup> FGHRS - flue gas heat recovery system utilized only when firing natural gas.

<sup>3</sup> Both of the burners in line drier #2b are gas IR, and part of the coating drying section of paper machine #2.

<sup>4</sup> Stack heights are referenced to the facility base elevation of 275' above MSL.

### 2.3 Description of Compliance Monitoring Devices

This Facility is not equipped with devices to continuously monitor the emission of air contaminants to the ambient air.

### 2.4 Proposed Modifications to Facility

The Permittee has not proposed to modify the Facility.

### 2.5 Identification of Sources with Insignificant or Negligible Emissions

| <b>Table 2-2: Insignificant Activities</b> |  |
|--|--|
| Space Heaters                              | 11 natural gas fired space heaters and one hot water heater that range in capacity from 0.025 to 0.160 MMBtu/hr (total capacity of 0.86 MMBtu/hr). |
| Maintenance Shop                           | Repair and maintenance shop activities   |
| Welding Equipment                          | Soldering and welding equipment for maintenance activities   |
| Propane Tanks                              | Propane Storage Tanks  |
| Fuel Oil Tank                              | No. 6 Fuel oil storage tank, capacity: 110,000 gallons   |
| Lab  | Paperboard testing lab   |
| Construction                               | Intermittent construction activities   |

Additionally, guidance provided by the U.S. EPA (entitled “White Paper for Streamlined Development of Part 70 Permit Applications”) lists activities which are considered as “trivial” sources of air contaminants and may be presumptively omitted from operating permit applications.

Table 2-2 lists activities at the Facility which were considered insignificant or exempt sources of air contaminant emissions, and therefore were not considered as emission sources as part of the Operating/Construction Permit review.

It should be noted that a process or piece of equipment which is considered a “negligible activity” does not relieve the owner or operator from the responsibility of complying with any applicable requirements associated with said process or equipment.

### 2.6 #6 Fuel Oil Limitations

Prior permits have restricted SO<sub>2</sub> emissions from the use of No.6 fuel oil in the boilers to 160.9 tons/year. This restriction limited the use of No.6 fuel oil. The limit, in terms of gallons of fuel oil, can be calculated using the following equation:

$$[(\text{GPY}_{\text{No. 6 fuel oil}}) * (\%S)] < 2,049,600$$

Where:

“GPY” means gallons of No. 6 fuel oil burned in the boilers;

“%S” means the weighted average sulfur content of the fuel expressed as percent by weight.

As of July 1, 2018, Vermont limits the sulfur content of No. 6 fuel oil to a maximum of 0.5% by weight. Using 0.5% sulfur content in the above equation results in a No. 6 fuel oil limit of 4,099,200 gallons/year to address SO<sub>2</sub> emissions.

The facility must also maintain NO<sub>x</sub> emissions, from all on-site stationary combustion sources, to less than 100 tons per year. The following equation can be used to calculate the amount of NO<sub>x</sub> emissions from fuel combustion:

$$\text{NO}_x \text{ Tons} = \{[\text{No. 6 fuel oil used (gal)} \times 55.0 \text{ lbs}/10^3 \text{ gal}] + [\text{Natural gas used (ft}^3\text{)} \times 100.0 \text{ lbs}/10^6 \text{ ft}^3] + [\text{Diesel engine fuel} \times 448 \text{ lb}/10^3 \text{ gal of distillate oil}]\} / (2000 \text{ lbs/ton})$$

If 4,099,200 gallons of No.6 fuel oil, noted above, are burned in the boilers, an estimated 113 ton/yr of NO<sub>x</sub> are emitted from the boilers. Note that this 113 ton/yr calculation does not include the natural gas fired in the coating ovens (potential of 5.5 tpy NO<sub>x</sub>), the stationary emergency diesel engines (based on 100 hours of operation, 2.6 tpy NO<sub>x</sub>), or the natural gas fired in the boilers. With the lower sulfur content requirements for No.6 fuel oil, NO<sub>x</sub> will become the limiting factor for annual usage of No.6 Fuel oil rather than SO<sub>2</sub>. Based on operating 8,760 hr/yr, it is estimated that No.6 fuel oil usage in the boilers is limited to 3,340,000 gallons/yr. This volume will be used for calculating the potential emissions shown in Section 3.0 below.

The permit has a condition limiting the NO<sub>x</sub> emissions from all combustion sources at the facility to not exceed 100 tons/year.

### 3.0 QUANTIFICATION OF POLLUTANTS

The quantification of emissions from a stationary source is necessary in order to establish the regulatory review process necessary for the operating permit application and to determine applicability with various air pollution control requirements. These determinations are normally based upon allowable emissions. Allowable emission is defined as the emission rate calculated using the maximum rated capacity of the source and, if applicable, either: (a) the applicable emission standard contained in the *Regulations*, if any, or (b) the emission rate or design, operational or equipment standard specified in any order or agreement issued under the *Regulations* that is state and federally enforceable. An applicant may impose in its application an emission rate or design, or an operational or equipment limitation which may be incorporated in the Permit to restrict operation to a lower level. Such limitations may include fuel restrictions or production limits.

#### 3.1 Estimating Potential Emission of Criteria Pollutants from the Existing Stationary Source

**Combustion Emissions:** Boilers, paper machine ovens and stationary diesel engines).

| <b>Table 3-1: Oil Fired Boilers – Estimated Potential Emissions</b>           |                      |                    |   |                                     |
|---|----------------------|--------------------|---|-------------------------------------|
| <b>Total Fuel input to the 4 boilers: 3,340,000 gallons/yr No.6 Fuel Oil</b>  |                      |                    |   |                                     |
| <b>See Section 2.6 above for explanation of how 3,340,000 was determined.</b> |                      |                    |   |                                     |
| Pollutant   | Emission Factor      |                    |   | Allowable Emissions (tons per year) |
|   | Factor <sup>1</sup>  | Units <sup>2</sup> | Source  |                                     |
| PM (total)  | 9.19(S)+3.22+1.5     | lb/1000 gal        | AP-42, Fuel Oil Combustion, Tables 1.3-1 and 1.3-2 (5/10) | 15.6                                |
| PM <sub>10</sub>  | 7.17*((1.12*S)+0.37) |                    | AP-42, Fuel Oil Combustion, Tables 1.3-5 (5/10)           | 11.1                                |
| PM <sub>2.5</sub>   | 4.67*((1.12*S)+0.37) |                    |   | 7.3                                 |
| CO  | 5                    |                    |   | 8.4                                 |
| NO <sub>x</sub>   | 55                   |                    | AP-42, Fuel Oil Combustion, Table 1.3-1 (5/10)            | 91.9                                |
| SO <sub>2</sub>   | 157S                 |                    |   | 131                                 |
| VOC   | 0.28                 |                    | AP-42, Fuel Oil Combustion, Table 1.3-3 (5/10)            | 0.5                                 |
| HAPs  | 0.155                |                    | AP-42, Fuel Oil Combustion, Tables 1.3-8 to 1.3-10 (5/10) | 0.26                                |

<sup>1</sup> S represents the weight % of sulfur in the oil. For example if the fuel is 0.5% sulfur, then S=0.5

<sup>2</sup> lb/1000 gal: pounds of pollutant emitted per 1000 gallons of fuel input to the boiler.

| <b>Table 3-2: Natural Gas Fired Boiler – Estimate Potential Emissions</b> |                 |                    |  |                                 |
|---|-----------------|--------------------|--|---------------------------------|
| <b>Total Fuel input: 1,551 MMCF natural gas (unrestricted operation).</b> |                 |                    |  |                                 |
| Pollutant   | Emission Factor |                    |  | Allowable Emissions (tons/year) |
|   | Factor          | Units <sup>1</sup> | Source   |                                 |
| PM  | 7.6             | lb/MMCF            | AP-42, Natural Gas Combustion, Table 1.4-2, 7/98           | 5.9                             |
| CO  | 84              |                    | AP-42, Natural Gas Combustion, Table 1.4-1, 7/98           | 65.1                            |
| NO <sub>x</sub>   | 100             |                    |  | 77.6                            |
| SO <sub>2</sub>   | 0.6             |                    | AP-42, Natural Gas Combustion, Table 1.4-2, 7/98           | 0.5                             |
| VOC   | 5.5             |                    |  | 4.3                             |
| HAPs  | 1.89            |                    | AP 42, Natural Gas Combustion, Tables 1.4-3 & 1.4-4 (7/98) | 1.5                             |

<sup>1</sup> lb/MMCF: pounds of pollutant per million cubic feet of natural gas combusted.

| <b>Table 3-3: Paper Machine Natural Gas Fired Ovens – Estimated Potential Emissions</b> |                 |                    |  |                                 |
|---|-----------------|--------------------|--|---------------------------------|
| <b>Total Fuel input: 110 MMCF natural gas (unrestricted operation).</b>                 |                 |                    |  |                                 |
| Pollutant   | Emission Factor |                    |  | Allowable Emissions (tons/year) |
|   | Factor          | Units <sup>1</sup> | Source   |                                 |
| PM  | 7.6             | lb/MMCF            | AP-42, Natural Gas Combustion, Table 1.4-2, 7/98           | 0.42                            |
| CO  | 84              |                    | AP-42, Natural Gas Combustion, Table 1.4-1, 7/98           | 4.6                             |
| NO <sub>x</sub>   | 100             |                    |  | 5.5                             |
| SO <sub>2</sub>   | 0.6             |                    | AP-42, Natural Gas Combustion, Table 1.4-2, 7/98           | 0.03                            |
| VOC   | 5.5             |                    |  | 0.3                             |
| HAPs  | 1.89            |                    | AP 42, Natural Gas Combustion, Tables 1.4-3 & 1.4-4 (7/98) | 0.10                            |

<sup>1</sup> lb/MMCF: pounds of pollutant per million cubic feet of natural gas combusted.

| <b>Table 3-4: Emergency Diesel Generator – Estimated Potential Emissions</b> |                 |                      |   |                              |
|--|-----------------|----------------------|---|------------------------------|
| <b>Non-Tier Engines &gt; 600 hp output</b>                                   |                 |                      |   |                              |
| Emission estimate based on 16 MMBtu/hr input and 100 hours                   | Emission Factor |                      |   | Allowable Emissions, tons/yr |
|  | Factor          | Units                | Source  |                              |
| PM   | 0.1             | lbMMBtu <sup>1</sup> | AP-42 Large Stationary Diesel and All Stationary Dual-fuel Engines, Tables 3.4-1, 3.4-3 and 3.4-4 (10/96) | 0.08                         |
| CO   | 0.85            |                      |   | 0.68                         |
| NO <sub>x</sub>  | 3.2             |                      |   | 2.56                         |
| SO <sub>2</sub>  | 0.0015          |                      | SO <sub>2</sub> emissions based on 15 ppm sulfur content.   | 0.001                        |
| VOC  | 0.09            |                      |   | 0.07                         |
| HAP  | 0.00157         |                      |   | 0.0013                       |

<sup>1</sup> lb/MMBtu represents pounds of pollutant emitted per million British thermal units of heat input to the engine.

| <b>Table 3-5: Emergency Fire Pump – Allowable Emissions</b>  |                 |                       |   |                              |
|--|-----------------|-----------------------|---|------------------------------|
| <b>Non-Tier Engines &lt; 600 hp output</b>                   |                 |                       |   |                              |
| Emission estimate based on 0.29 MMBtu/hr input and 100 hours | Emission Factor |                       |   | Allowable Emissions, tons/yr |
|  | Factor          | Units                 | Source  |                              |
| PM   | 0.31            | lb/MMBtu <sup>1</sup> | AP-42 Gasoline and Diesel Industrial Engines, Table 3.3-1 and 3.3-2 (10/1996) | 0.14                         |
| CO   | 0.95            |                       |   | 0.09                         |
| NO <sub>x</sub>  | 4.41            |                       |   | 1.2                          |
| SO <sub>2</sub>  | 0.00158         |                       | SO <sub>2</sub> emissions based on 15 ppm sulfur content.                     | 0.26                         |
| VOC  | 0.36            |                       |   | 0.1                          |
| HAPs   | 0.00387         |                       |   | 0.00006                      |

<sup>1</sup> lb/MMBtu represents pounds of pollutant emitted per million British thermal units of heat input to the engine.

**Process Emissions (VOCs):**

**Paper Machine Coatings – Estimated Potential VOC Emissions.** Refer to file caop19010.xlsx, TAB “PTE6 Coating & Productivity” for additional information.

Paper Machines #1 and #2 have a maximum running speed 450 ft/min and 620 ft/min respectively. The maximum width of the paperboard produced is 86 inches. This means the Facility has the potential to produce 4,030,476,000 ft<sup>2</sup>/yr of paperboard.

$$\left(1070 \frac{ft}{min} * \left(\frac{86}{12} ft\right) \left(1440 \frac{min}{day}\right)\right) * \left(365 \frac{day}{yr}\right) = 4,030,476,000 \text{ ft}^2/\text{yr}$$

At most, 9.0 pounds of dry coating can be applied per 1000 square feet of boxboard (4.5 pounds with the rod pre-coating and 4.5 pounds with the air knife top coating).

$$\left(4,030,476,000 \frac{ft^2}{yr}\right) \left(9.0 \frac{lb - dry}{1000 - ft^2}\right) = 36,274,284 \frac{lb - dry coating}{yr}$$

The average % VOC content is 0.1056 % (dry basis)

$$\left(36,274,284 \frac{lb - dry}{yr}\right) (0.1056 \%) = 38,305 \frac{lb VOC}{yr}$$

38,305 lb VOC/yr is the estimated potential emissions from the coatings. The estimated actual VOC emissions from the coatings are 20,000 lb/yr.

**Process VOC Emissions:** from boiler water treatment chemicals, stock prep processing aids and emissions wet end process additives. Refer to file caop19010.xlsx, TAB “PTE7 Process VOC” for details.

Based on the annual and potential usage of these process chemicals and the VOC content, there is an estimated 14.7 tons/year of VOC emissions. The assumption is that 100% of the VOCs are emitted to the atmosphere.

**3.2 - Hazardous Air Pollutants:**

Table 3-10 is a summary of the estimated emissions of Hazardous Air Pollutants (HAPs) from the Facility. The HAP emissions from the Facility’s boilers are based on the fuel type (natural gas or No.6 fuel oil) with the highest estimated emission rate and based on operating at the highest allowable fuel usage and AP-42 emission factors. The maximum natural gas usage from the paper machine coating line drying ovens was included in the boiler emissions. For estimating the emissions from the paper machine and stock prep areas, the Permittee used emission factors from National Council for Air and Stream Improvement (NCASI) Technical Bulletin 1050, as well as specific information for the concentration of acetaldehyde and vinyl acetate in their primary coating latex. The potential emissions are based on a potential paperboard production rate of

372 tons/day. This summary shows that the Facility's HAP emissions are less than 10 ton/yr for each HAP and less than 25 ton/yr for total HAP emissions. For detailed calculations, refer to file caop19010.xlsx. Note that the emission factors from NCASI TB 1050 are not specific to this Facility. They are representative of measured emissions from another papermill which also produces coated paperboard on a cylinder machine utilizing 100% secondary fiber furnish. In the NCASI study, this mill's code is "CCC." If any HAPs or HACs were below the test method's detection limit, then the data was not used in this review.

| <b>Table 3-10 Estimated HAP Emissions</b> |                               |                                       |  |                     |
|---|-------------------------------|---------------------------------------|--|---------------------|
| <b>HAP</b>                                | <b>Boiler Emissions (tpy)</b> | <b>Emergency Diesel Engines (tpy)</b> | <b>Paper Machine and Stock Preparation (tpy)</b> | <b>Totals (tpy)</b> |
| 1,1,1-Trichloroethane                     | 3.94E-04                      | --                                    | --   | <b>3.94E-04</b>     |
| 1,3-Butadiene                             | --                            | 5.72E-07                              | --   | <b>5.72E-07</b>     |
| Acetaldehyde                              | --                            | 3.14E-05                              | 4.27E+00   | <b>4.27E+00</b>     |
| Acrolein                                  | --                            | 7.66E-06                              | --   | <b>7.66E-06</b>     |
| Benzene                                   | 1.74E-03                      | 6.34E-04                              | --   | <b>2.38E-03</b>     |
| Biphenyl                                  | --                            | --                                    | 2.53E-02   | <b>2.53E-02</b>     |
| Carbon Disulfide                          | --                            | --                                    | 3.11E-01   | <b>3.11E-01</b>     |
| Chloroform                                | --                            | --                                    | 3.34E-03   | <b>3.34E-03</b>     |
| Cumene                                    | --                            | --                                    | 0.00E+00   | <b>0.00E+00</b>     |
| Dichlorobenzene                           | 9.97E-04                      | --                                    | --   | <b>9.97E-04</b>     |
| Ethylbenzene                              | 1.06E-04                      | --                                    | --   | <b>1.06E-04</b>     |
| Formaldehyde                              | 7.18E-02                      | 8.04E-05                              | 7.08E-01   | <b>7.80E-01</b>     |
| Hexane                                    | 1.50E+00                      | --                                    | --   | <b>1.50E+00</b>     |
| Methanol                                  | --                            | --                                    | 6.25E+00   | <b>6.25E+00</b>     |
| Methylene Chloride                        | --                            | --                                    | 1.13E-02   | <b>1.13E-02</b>     |
| Naphthalene                               | 1.89E-03                      | --                                    | 9.12E-01   | <b>9.14E-01</b>     |
| PAH                                       | 1.01E-04                      | 1.72E-04                              | --   | <b>2.73E-04</b>     |
| Phenol                                    | --                            | --                                    | 2.06E-02   | <b>2.06E-02</b>     |
| Propionaldehyde                           | --                            | --                                    | 1.49E-01   | <b>1.49E-01</b>     |
| Toluene                                   | 1.04E-02                      | 2.31E-04                              | 4.06E+00   | <b>4.07E+00</b>     |
| Vinyl Acetate                             | --                            | --                                    | 6.00E-01   | <b>6.00E-01</b>     |
| Xylenes                                   | 1.82E-04                      | 1.59E-04                              | --   | <b>3.41E-04</b>     |
| <b>Metals</b>                             |                               |                                       |  |                     |
| Antimony                                  | 8.77E-03                      | --                                    | --   | <b>8.77E-03</b>     |
| Arsenic                                   | 2.20E-03                      | --                                    | --   | <b>2.20E-03</b>     |
| Beryllium                                 | 4.64E-05                      | --                                    | --   | <b>4.64E-05</b>     |
| Cadmium                                   | 9.14E-04                      | --                                    | --   | <b>9.14E-04</b>     |
| Chromium                                  | 1.41E-03                      | --                                    | --   | <b>1.41E-03</b>     |
| Cobalt                                    | 1.01E-02                      | --                                    | --   | <b>1.01E-02</b>     |
| Lead                                      | 2.52E-03                      | --                                    | --   | <b>2.52E-03</b>     |

| <b>Table 3-10 Estimated HAP Emissions</b> |                               |                                       |  |                     |
|---|-------------------------------|---------------------------------------|--|---------------------|
| <b>HAP</b>                                | <b>Boiler Emissions (tpy)</b> | <b>Emergency Diesel Engines (tpy)</b> | <b>Paper Machine and Stock Preparation (tpy)</b> | <b>Totals (tpy)</b> |
| Manganese                                 | 5.01E-03                      | --                                    | --   | <b>5.01E-03</b>     |
| Mercury                                   | 2.16E-04                      | --                                    | --   | <b>2.16E-04</b>     |
| Nickel                                    | 1.41E-01                      | --                                    | --   | <b>1.41E-01</b>     |
| Selenium                                  | 1.14E-03                      | --                                    | --   | <b>1.14E-03</b>     |
| <b>Totals</b>                             | <b>1.76</b>                   | <b>1.32E-03</b>                       | <b>17.32</b>                                     | <b>19.08</b>        |

### **3.3 - Hazardous Air Contaminants:**

The same process emission factors were used with the actual average daily production rates (based on calendar years 2016 – 2018) to calculate the estimated emission of HACs. Table 3-11 lists the HACs that are estimated to exceed their respective Action Levels. With the exception of acetaldehyde, which is a component of the coating latex, the specific source(s) of the other HACs are not known at this time. Note that HAC emissions from the combustion of virgin liquid or gaseous fuel (natural gas and fuel oil) are exempt from the requirements of Section 5-161 and they are not included in Table 3-11.

| <b>Table 3-11 Hazardous Air Contaminants estimated to exceed their Action Level</b> |                     |              |                  |                |                              |
|---|---------------------|--------------|------------------|----------------|------------------------------|
| <b>Air Toxic</b>  | <b>HAC Category</b> | <b>CAS #</b> | <b>Tons/Year</b> | <b>lb/8-hr</b> | <b>Action Level (lb/8hr)</b> |
| Acetaldehyde  | 1                   | 75-07-0      | 2.89             | 5.29           | 0.038                        |
| Biphenyl  | 1                   | 92-52-4      | 0.02             | 0.036          | 0.00015                      |
| Chloroform  | 1                   | 67-66-3      | 0.0026           | 0.0048         | 0.0036                       |
| 1,2-Dimethoxyethane   | 2                   | 110-71-4     | 0.0021           | 0.0038         | 0.00083                      |
| Formaldehyde  | 1                   | 50-00-0      | 0.55             | 1.01           | 0.0065                       |
| Methylene Chloride  | 1                   | 75-09-2      | 0.01             | 0.02           | 0.17                         |
| Naphthalene   | 1                   | 91-20-3      | 0.72             | 1.31           | 0.020                        |

| <b>Table 3-12: Summary of Estimated Air Contaminant Emissions by Source (tons/year)</b> |  |             |                       |                       |               |                   |
|---|--|-------------|-----------------------|-----------------------|---------------|-------------------|
| <b>Source</b>   | <b>PM / PM<sub>10</sub> / PM<sub>2.5</sub></b> | <b>CO</b>   | <b>NO<sub>x</sub></b> | <b>SO<sub>2</sub></b> | <b>VOC</b>    | <b>Total HAPs</b> |
| Boilers (No. 6 Fuel Oil)  | 15.6 / 11.1 / 7.3                              | 8.4         | 91.9                  | 131                   | 0.5           | -                 |
| Boilers (natural gas)   | 5.8  | 64.7        | 77.0                  | 0.46                  | 4.2           | -                 |
| Boiler – highest emission rate  | 15.6 / 11.1 / 7.3                              | 64.7        | 91.9                  | 131                   | 4.2           | 1.76              |
| Paper machine drying ovens  | 0.42   | 4.6         | 5.5                   | 0.03                  | 0.3           | 0.1               |
| Stationary Diesel Engines   | 0.08   | 0.69        | 2.7                   | -                     | 0.08          | 0.0013            |
| Process Emissions (boiler water treatment, stock prep, wet end)                         | -  | -           | -                     | -                     | 19.1          | 13.1              |
| Paper Coating Emissions   | -  | -           | -                     | -                     | 14.7          | 4.27              |
| <b>Estimated Facility Emissions</b>   | <b>16.1 / 11.6 / 7.8</b>                       | <b>70.0</b> | <b>99.9</b>           | <b>131</b>            | <b>38.4</b>   | <b>19.1</b>       |
| <b>Allowable Facility Emissions</b>   | <b>17.7</b>                                    | <b>63.3</b> | <b>&lt;100</b>        | <b>162.3</b>          | <b>&lt;50</b> | <b>&lt;8/20</b>   |

As summarized in Table 3-12 above:

- The Facility has allowable emissions of all air contaminants in the aggregate of ten (10) or more tons per year: the Facility is therefore subject to Subchapter X of the Regulations and is designated as a Subchapter X Major Source.
- The Facility has allowable emissions of NO<sub>x</sub>, and SO<sub>2</sub> greater than 50 tons/year: this classifies the Facility as a "Major Stationary Source." Since the Permittee is not proposing any modifications to the facility which would increase emissions, they are not subject to the new source review requirements of §5-502 of the *Regulations* at this time.
- The Facility has allowable emissions of SO<sub>2</sub> greater than 100 tons/year which classifies the source as a "Title V Subject Source" and therefore is subject to the federal operating permit requirements of 40 C.F.R. Part 70 or 71.

### 3.4 – Estimating Potential Green House Gas Emissions

The first table is for maximum usage of No. 6 fuel oil in the boilers, maximum natural gas in paper machine ovens and 100 hours of operation of the stationary diesel engines. The fuel oil usage is limited by NOx.

|                    |                      |                 |
|--------------------|----------------------|-----------------|
| Facility: WestRock | Permit #: AOP-19-010 | Date: 8/24/2021 |
|--------------------|----------------------|-----------------|

**Table 1. Stationary Source Fuel Combustion**

| Source ID | Source Description | Fuel Combusted         | Quantity Combusted | Units   |
|-----------|--------------------|------------------------|--------------------|---------|
|           | coating dryers     | Natural Gas            | 110,328,938        | scf     |
|           | boilers            | Residual Fuel Oil #6   | 3,340,328          | gallons |
|           | emergency engines  | Distillate Fuel Oil #2 | 11,638             | gallons |

**Table 2. Total Facility-Wide Stationary Source Fuel Combustion**

| Fuel Type              | Quantity Combusted | Units   |
|------------------------|--------------------|---------|
| Distillate Fuel Oil #2 | 11,638             | gallons |
| Residual Fuel Oil #6   | 3,340,328          | gallons |
| Natural Gas            | 110,328,938        | scf     |

**Table 3. Total Facility-wide CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O Emissions from Stationary Source Fuel Combustion**

| Fuel Type  | CO <sub>2</sub> (kg) | CO <sub>2</sub> (lb) | CH <sub>4</sub> (kg) | CH <sub>4</sub> (lb) | N <sub>2</sub> O (kg) | N <sub>2</sub> O (lb) |
|--|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|
| Distillate Fuel Oil #2   | 118,779              | 261,862              | 4.8                  | 10.6                 | 1.0                   | 2.1                   |
| Residual Fuel Oil #6   | 37,628,800           | 82,957,205           | 1,503.1              | 3,313.9              | 300.6                 | 662.8                 |
| Natural Gas  | 6,013,430            | 13,257,329           | 113.4                | 250.0                | 11.3                  | 25.0                  |
| Total Fossil Fuel Emissions  | 43,761,009           | 96,476,396           | 1,621.4              | 3,574.5              | 312.9                 | 689.9                 |
| Total Emissions for all Fuels  | 43,761,009           | 96,476,396           | 1,621.4              | 3,574.5              | 312.9                 | 689.9                 |
| Global Warming Potential   | CO <sub>2</sub>      | CH <sub>4</sub>      | N <sub>2</sub> O     | CO <sub>2</sub> e    |                       |                       |
|  | 1.0                  | 25.0                 | 298.0                | metric ton           | short ton             |                       |
| <b>Total CO<sub>2</sub> Emissions - Equivalent (Fossil CO<sub>2</sub>e + Biogenic CH<sub>4</sub> &amp; N<sub>2</sub>O)</b> |                      |                      |                      | <b>43,894.8</b>      | <b>48,385.7</b>       |                       |
| <b>All CO<sub>2</sub>e emissions at stack (Fossil CO<sub>2</sub>e + Biogenic CO<sub>2</sub>e) - for APCD Permit info</b>   |                      |                      |                      | <b>43,894.8</b>      | <b>48,385.7</b>       |                       |

The second table is for the maximum use of natural gas in the boilers, the paper machine drying ovens and 100 hours of operation of the stationary diesel engines.

|                    |                      |                 |
|--------------------|----------------------|-----------------|
| Facility: WestRock | Permit #: AOP-19-010 | Date: 6/14/2021 |
|--------------------|----------------------|-----------------|

**Table 1. Stationary Source Fuel Combustion**

| Source ID | Source Description     | Fuel Combusted         | Quantity Combusted | Units   |
|-----------|------------------------|------------------------|--------------------|---------|
|           | boilers&coating dryers | Natural Gas            | 1,661,802,928      | scf     |
|           | boilers                | Residual Fuel Oil #6   | 0                  | gallons |
|           | emergency engines      | Distillate Fuel Oil #2 | 11,638             | gallons |

**Table 2. Total Facility-Wide Stationary Source Fuel Combustion**

| Fuel Type              | Quantity Combusted | Units   |
|------------------------|--------------------|---------|
| Distillate Fuel Oil #2 | 11,638             | gallons |
| Residual Fuel Oil #6   | 0                  | gallons |
| Natural Gas            | 1,661,802,928      | scf     |

**Table 3. Total Facility-wide CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O Emissions from Stationary Source Fuel Combustion**

| Fuel Type  | CO <sub>2</sub> (kg) | CO <sub>2</sub> (lb) | CH <sub>4</sub> (kg) | CH <sub>4</sub> (lb) | N <sub>2</sub> O (kg) | N <sub>2</sub> O (lb) |
|--|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|
| Distillate Fuel Oil #2   | 118,779              | 261,862              | 4.8                  | 10.6                 | 1.0                   | 2.1                   |
| Residual Fuel Oil #6   | 0                    | 0                    | 0.0                  | 0.0                  | 0.0                   | 0.0                   |
| Natural Gas  | 90,575,837           | 199,685,303          | 1,708.3              | 3,766.2              | 170.8                 | 376.6                 |
| <b>Total Fossil Fuel Emissions</b>   | <b>90,694,616</b>    | <b>199,947,165</b>   | <b>1,713.2</b>       | <b>3,776.8</b>       | <b>171.8</b>          | <b>378.7</b>          |
| <b>Total Emissions for all Fuels</b>   | <b>90,694,616</b>    | <b>199,947,165</b>   | <b>1,713.2</b>       | <b>3,776.8</b>       | <b>171.8</b>          | <b>378.7</b>          |
| Global Warming Potential   | CO <sub>2</sub>      | CH <sub>4</sub>      | N <sub>2</sub> O     | CO <sub>2</sub> e    |                       |                       |
|  | 1.0                  | 25.0                 | 298.0                | metric ton           | short ton             |                       |
| <b>Total CO<sub>2</sub> Emissions - Equivalent (Fossil CO<sub>2</sub>e + Biogenic CH<sub>4</sub> &amp; N<sub>2</sub>O)</b> |                      |                      |                      | <b>90,788.6</b>      | <b>100,077.2</b>      |                       |
| <b>All CO<sub>2</sub>e emissions at stack (Fossil CO<sub>2</sub>e + Biogenic CO<sub>2</sub>e) - for APCD Permit info</b>   |                      |                      |                      | <b>90,788.6</b>      | <b>100,077.2</b>      |                       |

#### 4.0 DISCUSSION OF SELECT APPLICABLE AND NON-APPLICABLE REQUIREMENTS

The Agency will assess compliance with these regulations during any inspections of the Facility. The inspections will include confirmation of the proper operation and maintenance of equipment and air pollution control devices, visual observations of emission points, and review of any records required by the Permit.

##### 4.1 Vermont Air Pollution Control Regulations and Statutes

###### **§5-201 and §5-202 - Open Burning Prohibited and Permissible Opening Burning**

This emission standard, which regulates the open burning of materials, applies to the entire Facility. Open burning of materials is prohibited except in conformance with the requirements of this section

Based on information provided by the Permittee, the Facility complies with this regulation. During future inspections of the Facility, the Agency will verify if there has been open burning activity at the Facility and if these activities are in compliance with this requirement.

###### **§5-211(1) - Prohibition of Visible Air Contaminants - Installations constructed prior to April 30, 1970**

These emission standards apply to Boilers #1, #3 and #4, as well as the 1950 vintage emergency generator.

###### **§5-211(2) - Prohibition of Visible Air Contaminants - Installations constructed subsequent to April 30, 1970**

This emission standard applies to Boiler #2, the diesel engine powered fire pump, and the paperboard coating lines.

###### **§5-221(1) - Prohibition of Potentially Polluting Materials in Fuel; Sulfur Limitation in Fuel**

This prohibition applies to all stationary fuel burning equipment used on-site. The applicant is expected to comply with this regulation based on the use of ultra-low sulfur diesel in the diesel engines and the use of either natural gas or No. 6 fuel oil certified by the supplier to contain no more than 0.5% sulfur by weight in the boilers. Natural gas/LPG by their fuel specification definition, comply with this requirement.

###### **§5-231(3) - Prohibition of Particulate Matter; Combustion Contaminants**

Based on the application submitted and information available to the Agency, this Facility currently has applicable fuel burning equipment subject to this regulation. The allowable particulate emissions from the subject equipment is shown in Table 4-1.

- (i) 0.5 pounds per hour per million BTU's of *heat input* in combustion installations where the *heat input* is 10 million BTU's or less per hour.
- (ii) For combustion installations where the *heat input* is greater than 10 million BTU's per hour, but where the *heat input* is equal to or less than 250 million BTU's per hour, the applicable limit is determined by using the following formula:

$$E_{PM} = 10^{[-0.47039(\log_{10} HI) + 0.16936]}$$

where:

- $E_{PM}$  - is the *particulate matter emission* limit, expressed to the nearest hundredth pound per hour per million BTU's; and
- HI - is the *heat input* in millions of BTU's per hour.

For the Wickes Boiler #1, B&W Boilers #3 & #4, and the Cleaver-Brooks Boiler #2 when firing oil:

The allowable particulate emissions from the subject equipment are shown in Table 4-1.

| <b>Table 4-1: Equipment Subject to §5-231(3)(a)</b> |                           |   |  |
|---|---------------------------|---|--|
| <i>Equipment ID</i>                                 | <i>Size/<br/>Capacity</i> | <i>Emission Standard,<br/>lbs/MMBtu</i> | <i>Allowable Emissions,<br/>lbs/hr</i> |
| Wickes Boiler #1                                    | 89                        | 0.18                                    | 16.0                                   |
| Cleaver-Brooks Boiler #2                            | 28.6                      | 0.30                                    | 8.85                                   |
| B&W Boiler #3                                       | 33                        | 0.29                                    | 9.6                                    |
| B&W Boiler #4                                       | 31                        | 0.29                                    | 9.0                                    |

**§5-241(1) - Prohibition of Nuisance and Odor; Nuisance**

This requirement applies to the entire Facility and prohibits the discharge of air contaminants that would be a nuisance to the public or the discharge of objectionable odors beyond the property-line of the Facility.

Based on the application submittal and information available to the Agency, the Facility currently is in compliance with this regulation. The Agency will verify compliance with this requirement in the future during any inspections of the Facility. Additionally, the Agency investigates complaints that it receives in order to determine whether or not there is a violation of this requirement.

**§5-253.8 – industrial Adhesives**

This section regulates the release of VOCs from industrial adhesives. This facility does not use industrial adhesives.

**§5-253.10 - Control of Volatile Organic Compounds - Paper Coating.**

This section regulates the release of VOCs from all paper coating units, except units within a paper coating source that have actual emissions without control devices from all paper coating units within the source of less than fifteen (15) pounds of VOCs per day (“lbs/day”). Once a source becomes subject to this subsection, it shall remain so even if emission levels subsequently fall below the applicable threshold.

Based on the information provided by the Permittee in the permit renewal application, the paper coatings release an estimated 19,999 lbs of VOC emissions. Assuming that the

Facility operates 365 days per year, the Agency estimated that the daily VOC emissions from the coating operations is 55 pounds per day which is greater than the 15 lb/day threshold noted in §5-253.10(a) of the *Regulations*. Using this estimate, the Agency has determined that the Permittee is subject to §5-253.10 of the *Regulations*.

As a subject source, the Permittee shall not cause, allow or permit the daily-weighted average VOC content of paper coatings applied to exceed 2.9 pounds of VOCs per gallon (excluding water and exempt compounds).

The Permittee uses water-based coatings which contain a small amount of VOCs.

To assure compliance with this standard, the Agency has included monitoring and record keeping requirements in the Permit. The Permittee is required to record the amount of each paper coating used monthly, as well as the density, the volatile organic compound content (expressed as a weight percentage and volume percentage), and the solids content (expressed as a weight percentage) of each paper coating.

**§5-261 - Control of Hazardous Air Contaminants**

See Section 6.0 below.

**§5-271 – Control of Air Contaminants from Stationary Reciprocating Internal Combustion Engines**

This emission standard applies to all stationary reciprocating internal combustion engines with a brake horsepower output rating of 450 hp or greater.

Based on the application submittal and information available to the Agency, the Facility currently is in compliance with this regulation, as they have no non-emergency stationary reciprocating engines with an output rating of 450 bhp or greater. However, a condition will be included as part of the permit to specifically identify this limitation. The Agency will verify compliance with this requirement in the future during any inspections of the Facility.

**§5-402 – Written Reports When Required**

This section gives the Agency authority to require the Facility to submit reports summarizing records required to be maintained by the Agency. The Agency will assess compliance with this regulation in the future during any inspections of the Facility.

**§5-403 – Circumvention**

This section prohibits the dilution or concealment of an air discharge in order to avoid air pollution control requirements. The Agency will assess compliance with this regulation in the future during any inspections of the Facility.

**§5-404 – Methods for Sampling and Testing of Sources**

This section allows the Agency to require testing of air emissions from the Facility and to specify the methods of testing. Based on the application submittal and information available to the Agency, the Facility currently is in compliance with this regulation. The Agency will assess compliance with this regulation in the future during any required testing or inspections of the Facility.

**Subchapter VIII – Registration of Air Contaminant Source.**

This Subchapter requires the owner or operator of a stationary source register with the Agency if the source produces five (5) tons per year or greater of actual emissions during the preceding calendar year. The owner or operator of a source is required to submit information regarding their operations and pay a fee based upon the quantity of emissions they produce and the fuels that they use at the source.

The Permittee is currently in compliance and has been registering its emissions with the Agency annually on those years when its total emissions exceed 5 tons per year.

**4.2 Federal Air Pollution Control Regulations and the Clean Air Act**

Federal regulations that apply to the Facility, are shown the Permit AOP-19-010, Findings of Fact section (F)(a)(iv) Federal Requirements.

**Section 111 of the Clean Air Act - New Source Performance Standards (NSPS).** NSPSs are promulgated under Title 40 of the Code of Federal Regulations ("40 C.F.R.") Part 60. The NSPSs that were reviewed for applicability and the applicable NSPSs are summarized in the following table.

| <b>Table 4-2<br/>Discussion of Requirements from Section 111 of the Clean Air Act<br/>New Source Performance Standards (NSPSs)</b>  |
|---|
| 40 CFR Part 60, Subpart Dc – see permit   |
| 40 CFR Part 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE). Applies to CI RICE model year 2007 and later as well as those ordered after July 11, 2005 and with an engine manufacture date after April 1, 2006. This standard also applies to stationary CI RICE that are modified or reconstructed after July 11, 2005. This regulation established emission rates for affected engines, requires routine engine maintenance and sets maximum sulfur content for the diesel fuel. Beginning October 1, 2010 applicable engines shall only use diesel fuel with a maximum sulfur content of 15 ppm (ULSD).<br><br><i>The Facility's stationary CI engines were installed before 2005 and are not subject to this regulation.</i> |

**Section 112 of the Clean Air Act - National Emission Standards for Hazardous Air Pollutants (NESHAPs).** NESHAPs are promulgated under 40 C.F.R. Part 61 and Part 63. Total HAP emissions are estimated to be less than 1 ton per year, so the Facility would be classified as an area source of HAPs. The applicable NESHAPs are summarized in the following table.

| <b>Table 4-3<br/>Discussion of Requirements from Section 112 of the Clean Air Act<br/>National Emission Standards for Hazardous Air Pollutants (NESHAPs)</b> |
|--|
| 40 CFR Part 63, Subpart ZZZZ – see permit  |

| <b>Table 4-3</b><br><b>Discussion of Requirements from Section 112 of the Clean Air Act</b><br><b>National Emission Standards for Hazardous Air Pollutants (NESHAPs)</b>  |
|---|
| 40 <i>CFR</i> Part 63, Subpart JJJJJJ – see permit  |
| <p>40 <i>CFR</i> Part 63, Subpart S - National Emission Standards for Hazardous Air Pollutants for Pulp and Paper (non-combust) MACT. This subpart regulates the emissions from the pulp production sources, which include pulping process vents, bleaching process vents, and condensate streams. This is a Major HAP source MACT standard.</p> <p><i>The Facility is not subject to this regulation since it is not a Major HAP source. Furthermore, it is not a pulp production source and does not have any pulping process vents, bleaching process vents, and pulping condensate streams.</i></p>                         |
| <p>40 <i>CFR</i> Part 63, Subpart MM - National Emission Standards for Hazardous Air Pollutants for Combustion Sources at Kraft, Soda, and Sulfite Pulp &amp; Paper Mills (Pulp and Paper MACT II). This subpart regulates the emissions from pulp mill combustion sources, which are recovery furnaces, smelt dissolving tanks, and lime kilns. This is a Major HAP source MACT standard.</p> <p><i>The Facility is not subject to this regulation since it is not a Major HAP source. Furthermore, it is not a pulp production source and does not have any recovery furnaces, smelt dissolving tanks, or lime kilns.</i></p> |

| <b>Table 4-4</b><br><b>Section 114 of the Clean Air Act</b>  |
|--|
| <p>Clean Air Act §§114(a)(3) Inspections, Monitoring and Entry; 502(b) Permit Programs; and 504(a)-(c) Permit Requirements and Conditions; 40 <i>CFR</i> Part 64 Compliance Assurance Monitoring; 40 <i>CFR</i> Part 70 §§70.6(a)(3)(i)(B) and 70.6(c)(1) State Operating Permit Programs - Permit content. Upon renewal of a Title V Permit to Operate, a facility must comply with enhanced monitoring and compliance assurance monitoring requirements if applicable. the CAM rule applies to each Pollutant Specific Emission Unit (PSEU) at a major source that is required to obtain a part 70 or part 71 permit if the unit satisfies all of the following criteria:</p> <ol style="list-style-type: none"> <li>1) The unit is subject to an emission limitation or standard for the applicable regulated air pollutant other than an emissions limitation or standard that is exempt under §64.2(b)(1) [exempt limitations include emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to Section 111 or 112 of the Act],</li> <li>2) The unit uses a control device to achieve compliance with any such limit or standard; and</li> <li>3) The unit has pre-control device emissions of the applicable regulated pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.</li> </ol> <p><i>The Compliance Assurance Monitoring requirements do not apply to this Facility since the potentially affected units are not equipped with an emission control device.</i></p> |

| <b>Table 4-5</b>   |  |
|--|--|
| <b>40 CFR Part 98: Mandatory Greenhouse Gas Reporting</b>  |  |
| <p>40 CFR Part 98 Mandatory Greenhouse Gas Reporting. Requires reporting of GHG emissions annually to EPA for:</p> <p>1) facilities in source categories listed in §98.2(a)(1) including electric utility units subject to Acid Rain, MSW landfills that generate CH<sub>4</sub> in amounts equivalent to 25,000 metric tons of CO<sub>2</sub>e or more per year and electrical transmission and distribution equipment at facilities where the total nameplate capacity of SF<sub>6</sub> and PFC containing equipment exceeds 17,820 pounds,</p> <p>2) facilities in source categories listed in §98.2(a)(2) including electronics manufacturing, iron and steel production and pulp and paper manufacturing that emit 25,000 metric tons of CO<sub>2</sub>e or more per year from such source categories as well as all stationary combustion,</p> <p>3) facilities with stationary combustion sources that aggregate to 30 MMBTU/hr or more and which emit 25,000 metric tons of CO<sub>2</sub>e or more per year from all stationary combustion sources combined, and</p> <p>4) fuel suppliers including all local natural gas distribution companies.</p> <p><i>The U.S. EPA has retained the implementing authority for this regulation and is responsible for determining applicability. This regulation under Part 98 is not considered to be an applicable requirement per 40 CFR Part 70.2 and as noted in 74 FR 56260 (October 30, 2009). Part 98 is anticipated to apply to the Facility and the Facility has filed such reports annually starting in 2010.</i></p> |  |

**4.3 Summary of Emission Testing for Previous Permit Test Requirements**

| <b>Table 4-6 Summary of Emission Testing</b> |                  |                    |                  |                            |                                |
|--|------------------|--------------------|------------------|----------------------------|--------------------------------|
| <b>Source</b>                                | <b>Test Date</b> | <b>Fuel tested</b> | <b>Pollutant</b> | <b>Emissions, lb/MMBtu</b> | <b>Emissions, lb/1,000 gal</b> |
| Wickes Boiler #1                             | 9/28/2006        | No. 6 Fuel oil     | NOx              | 0.31                       | 46.3 lb. NOx                   |
|  |                  |                    | CO               | 0.0052                     | -                              |
| Wickes Boiler #1                             | 8/23/2011        | No. 6 Fuel oil     | NOx              | 0.33                       | 49.5 lb. NOx                   |
|  |                  |                    | PM-total         | 0.157                      | -                              |
|  |                  | Natural gas        | NOx              | 0.11                       | -                              |
| B&W Boiler #4                                | 10/20/2016       | No. 6 Fuel oil     | NOx              | 0.26                       | 38.8 lb. NOx                   |
|  |                  |                    | CO               | 0.002                      | -                              |
|  |                  |                    | PM - total       | 0.033                      | -                              |
|  |                  | Natural gas        | NOx              | 0.136                      | -                              |
|  |                  |                    | CO               | 0.001                      | -                              |

**5.0 AMBIENT AIR QUALITY IMPACT EVALUATION**

The Facility is not undergoing changes subject to new source review; therefore, this section is not applicable.

**6.0 HAZARDOUS AIR CONTAMINANTS**

The emissions of hazardous air contaminants (“HACs”) are regulated under to §5-261 of the Regulations. The Owner/Operator of a source must quantify its emissions of HACs regulated by this rule. Any Facility whose emission rate of a HAC exceeds its respective Action Level (“AL”) is subject to the rule for the HAC, and the Owner/Operator must then demonstrate that the emissions of the HAC are minimized to the greatest extent practicable by achieving the Hazardous Most Stringent Emission Rate (“HMSE”) for that HAC. If the emission rate of any HAC after achieving

HMSEER is still estimated to exceed its action level after achieving HMSEER, an air quality impact evaluation may be required to further assess the ambient impacts for compliance with the Hazardous Ambient Air Standard (“HAAS”) or Stationary Source Hazardous Air Impact Standard (“SSHAIS”).

New Emission Factors from NCASI:

As noted in Section 3 above, the AOP-19-010 operating permit renewal application included emission factors from NCASI Technical Bulletin 1050 (September 2018) for estimating the HAC emissions from the paper machine and stock prep areas at paper mills processing 100% recovered fiber. This data supports the Facility’s assertion that it is not a Major Source of HAPs. A summary of HAP emissions is shown in Table 3-10.

As shown in Table 3-11 in Section 3, the facility is expected to exceed the action level of seven HACs: Acetaldehyde (75-07-0), biphenyl (92-52-4), chloroform (67-66-3), 1,2-dimethoxyethane (110-71-4), formaldehyde (50-00-0), methylene chloride (75-09-2), and naphthalene (91-20-3) and is therefore subject to §5-261.

Review of HAC reductions at the Facility:

On March 28, 2007, the Agency amended §5-261 of the *Regulations*. This change to the regulations included updating the Action Levels for numerous HACs, including acetaldehyde and vinyl acetate. The AL for acetaldehyde was reduced from 75.6 lb/8-hr to 0.038 lb/8-hr and the vinyl acetate AL was reduced from 14.7 to 1.7 lb/8-hr. Prior to this change in the ALs, the Permittee’s emissions of acetaldehyde and vinyl acetate were estimated to be below their respective AL. The estimated emissions used the MSDS’s reported concentration of acetaldehyde and vinyl acetate and assumed 100% of these compounds evaporate during the mixing, application and drying of the coating. With the new lower ALs, the estimated emission of acetaldehyde and vinyl acetate exceeded their respective AL. At that time, the Permittee commenced reviewing the basis for the estimated emissions to help ensure it is an accurate estimate and they started reviewing how they can reduce the emission of these two HACs.

Acetaldehyde and vinyl acetate are components of Polyco 3103 NP, the main latex product used in their paperboard coating. The investigation established that the MSDS for this coating listed the content of these two ingredients at 900 ppm for vinyl acetate and 950 ppm for acetaldehyde, while the measured content from 483 batches (covering 12 months of production) averaged 232 for acetaldehyde and 371 ppm for vinyl acetate. Permit AOP-05-018B, issued on 2/12/2008 established HMSEER to be the use of a latex with an average acetaldehyde content limit of 350 ppm and an average vinyl acetate content limit of 450 ppm. Permit AOP-10-038, issued on 11/12/014, relaxed the acetaldehyde limit to 450 ppm. This was needed to allow the Permittee to find alternate suppliers for this latex product.

During 2008, the Permittee also started to evaluate other latex products to see if they could reduce the estimated emissions of acetaldehyde and vinyl acetate. They did not find a suitable substitute latex, but they also established that while an alternate latex product might have had lower levels of acetaldehyde and vinyl acetate, the other products emitted other HAC compounds such as formaldehyde, ethylbenzene, acrylonitrile, 1,3 butadiene and styrene.

Their paper coating uses two materials as ‘binders’ for the coating: the Polyco 3103 NP and a soy protein product. By adjusting their coating formulation, they were able to use a little more of the soy protein product and less of the latex. This helped reduce the amount of acetaldehyde

and vinyl acetate being emitted from the coating. The Permittee also changed to a “pre-neutralized” soy protein product that allowed them to eliminate the use of ammonium hydroxide in the coating which eliminated the ammonia, another HAC, emissions associated with the use of the soy protein binder.

The Permittee also worked with their latex supplier to try and quantify if less than 100% of acetaldehyde and vinyl acetate are released from the facility: a portion of these compounds could be chemically bound in the paper coating and not be released to the atmosphere. Preliminary information indicated that some of these two HACs become part of the final coating and are not released to the atmosphere. There were some issues with the analytical test method and the detection limit(s) of the test. At that time, the Agency stayed with the conservative assumption that 100% of these two HACs were emitted.

The concentration of acetaldehyde and vinyl acetate in the latex are reported to the Agency every year. This data shows that the estimated emissions of vinyl acetate no longer exceeds its Action Level and therefore no longer requires an HMSER limit. The estimated emissions of acetaldehyde from the coating latex continues to exceed its Action Level.

EPA MACT review of 40 CFR Part 63, Subpart S (MACT I & MACT III):

When the EPA developed the MACT standards for pulp and papermaking operations, they concluded that the papermaking process did not contribute significantly to the industry’s overall HAP emissions, and they noted no air pollution control devices were in place. As a result, the EPA did not establish limits or require the use of specific technologies to reduce the HAP emissions from stock prep systems and paper machines at facilities subject to MACT III requirements (i.e., the MACT floor was no control). During the original rule development, the EPA evaluated two undemonstrated control measures that could potentially reduce HAP emissions from papermaking: (1) removal of HAPs from the pulp stock and white water before the papermaking system (e.g., with a white-water steam stripper); and (2) control of papermaking system vent streams through vent gas collection and incineration. Analysis of these control options concluded that there are no demonstrated methods for removing HAPs from the pulp stock or white water and that applying HAP control to the vent streams of papermaking systems is not cost-effective (Air Docket A-95-31, IV- B-8 [ERG 1997a]). Technical challenges noted with these two control options included fiber clogging of the steam stripper columns and heat exchangers, and the extremely high air flow rates from paper machines to be treated with incineration controls. EPA also concluded that a standard for papermaking systems based on low-HAP additive substitution was not warranted at the time of promulgation in 1998. As part of the 2011 technology review, the Part I ICR data along with BACT determinations for papermaking were examined to determine if there have been developments in practices, processes, or controls applicable to papermaking systems since subpart S promulgation in 1998. (RTI 2011b) The only available measures for reducing papermaking HAP emissions include process changes or work practices (e.g., practices relating to VOC in papermaking additives). Add-on controls for HAP emissions have not been put into practice and remain undemonstrated.<sup>1</sup>

BACT reviews:

In conjunction with this permit renewal, a review of the EPA’s RBLC shows that there has not

---

<sup>1</sup> Memorandum dated 11/16/2011 from Katie Hanks and Thomas Holloway of RTI International, to John Bradfield and Bill Schrock of the EPA – Subject: Section 112(d)(6) Technology Review for Pulping and Papermaking Processes EPA Contract No. EP-D-11-084; Work Assignment No. 0-03

been any development in the use of control technologies for VOCs or organic HAP emissions from stock prep systems and/or paper machines. There have been some BACT determinations for these facilities which require pollution prevention techniques: requiring the use of process additives which have low VOC content and/or low HAP content. Here are three facilities representing this type of BACT determinations.

Green Bay Packaging: RBCL ID: WI-0267 is a BACT determination for the Green Bay Packaging, Inc. facility located at 1601 North Quincy Street, Green Bay, WI. This mill's construction permit is for a new paper machine and recycle plant stock preparation system. No control equipment was required; BACT was determined to be the use of low-HAP containing additives. This permit was issued 9/6/2018.

Michigan Paperboard Company: RBCL ID: MI-0264 is a BACT determination for Michigan Paperboard Company (now Graphics Packaging International, Inc.) for rebuilding Paper Machine No. 1. This BACT determination does not require any controls but limits the coating emission of acetaldehyde to 1.08 tpy. This limit is met through pollution prevention techniques: coating formulation. This permit was issued 1/13/2000.

McKinley Paper Company: In 2019, the McKinley Paper Company in Port Angeles, WA proposed to rebuild their paper machine and recycled pulp plant. Their permit application included the use of the NCASI emission factors for toxic air pollutants and a tBACT analysis. The tBACT analysis for the toxic air pollutants from the paper machine and the recycled pulp plant concluded that BACT is achieved with emission limitations (acetaldehyde, formaldehyde, chloroform and methylene chloride) and work practice standards. Demonstration of meeting these emission limitations is to be done with the use of emission factors and actual production rates. No add-on control technology was required. This construction permit was issued 8/27/2019.

In the Permittee's operating permit renewal application, they summarized the reasons that the installation of pollution control devices for reducing organic HAC emissions is cost prohibitive: (1) cost of enclosure of the process equipment, (2) high volume of exhaust gases that would need to be controlled, and (3) the low concentration of the HAC in the process exhaust gases. The Agency agrees with this analysis. Also, the high moisture content of the exhaust gases would interfere with the performance of the control equipment.

#### **6.1 HMSER Selection**

If the emission of any HAC from all regulated sources at the Facility is estimated to exceed its AL, then the Facility is subject to the rule and the emissions must be reduced to achieve HMSER for that HAC.

The Agency is reestablishing the HMSER to be an acetaldehyde content limit of 450 ppm for all coating components used in the paperboard manufacturing process. This HMSER evaluation shall be subject to re-evaluation five (5) years from the date of its determination and shall remain in effect until revised by the Agency.

Due to the large exhaust volume and low concentration of biphenyl (92-52-4), chloroform (67-66-3), 1,2-dimethoxyethane (110-71-4), formaldehyde (50-00-0),

methylene chloride (75-09-2), and naphthalene (91-20-3) in the exhaust from the paper machines and the stock preparation system the cost of control would be excessive for the relatively low quantities of HACs. Currently, there are no economically feasible controls available to reduce the emissions of biphenyl (92-52-4), chloroform (67-66-3), 1,2-dimethoxyethane (110-71-4), formaldehyde (50-00-0), methylene chloride (75-09-2), and naphthalene (91-20-3). These emissions from the paper machines and stock preparation are not subject to any federal emission standards are and we are not aware of any similar plants in the country that require such emissions to be controlled.

If the emission rate of any HAC after achieving HMSER is still expected to exceed its AL, the Agency may require an air quality impact evaluation to further assess the ambient impacts for compliance with the HAAS or SSHAIS.

The Agency has reviewed several factors relating to this Facility, including, but not limited to those listed in §5-261(3)(a)-(c) of the *Regulations* and the level of emissions and emission reduction measures typical for this category of emission source.

The secondary fiber repulping process, paper machines and coaters are heated processes: this helps aide in the dispersion of the HACs.

Based on this review, the Agency is not requiring the Facility to conduct an air quality impact evaluation pursuant to §5-261(3) of the *Regulations* at this time.